



## PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

U.S. PATENT OFFICE

## Improvements in and relating to apparatus for Amusements and Instructional Purposes

I, FREDERICK HUGH PERCY BUCKNER, a British subject, of Blue Cedars, Lewes Road, East Grinstead, Sussex, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to apparatus for amusement and/or instruction purposes.

More particularly, it is concerned with apparatus for simulating water-skiing.

In countries in which the opportunities of water-skiing are few, the individual has little or no opportunity of making himself expert in the sport or even familiarising himself with it and is thus not able to take advantage of the facilities which become available to him when he goes abroad.

The invention provides him with means which enable him readily and at all times to acquire at least a modicum of skill.

An apparatus in accordance with the invention comprises an open topped container having an opening of at least such a size as to accommodate a skier standing on water skis, means for circulating through the container in the direction of its length a shallow stream of water and support means enabling a skier to hold himself against being entrained by the stream of water while he endeavours to remain supported on his skis on the surface of the stream.

In the preferred form of the invention the container has supported within it a horizontal platform which extends across its whole width below the intended water level. The platform stops short of the end walls of the container so that the platform can be submerged. In the space below the platform, means are provided for driving the water lengthwise of the container so that it moves in a closed circuit in opposite directions above and below the platform. Alternatively the means for driving

the water lengthwise of the container may be mounted at one end of the container.

In order to allow the skier to hold himself against being entrained by the stream of water, a bar may be provided in front of him near to one end of the container and he can then hold onto it. Alternatively he can grip a bar attached by one or more flexible cords to fixed means, the cords simulating the effect of water-ski tow ropes.

With a suitable velocity of the stream of water and with some degree of skill on the part of the skier, he can maintain himself water-skiing on the surface of the stream of water and acquire the sensation of moving over the surface.

Examples of apparatus in accordance with the invention will now be described with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a sectional side elevation of one apparatus showing a person in a water-skiing position;

Figure 2 is a plan view of a modified apparatus;

Figure 3 is a sectional side elevation on the line 3—3 of Figure 2, and

Figure 4 is a sectional end elevation on the line 4—4 of Figure 3.

The apparatus 10 shown in Figure 1 comprises a container 11 in which is fixed a platform 12. This platform extends across the full width of the container but stops short of the ends 14 of the container which are curved. Below the platform is a screw 16 which is driven by a motor (not shown) outside the container.

The platform is submerged by water in the container to a depth of about nine inches. The screw 16 propels the water beneath the platform to the right end and the water above it is forced to move to the left so that the whole mass of water is in circulation. The

curved ends of the container ensure a reasonably smooth passage of the water through the openings formed at the ends of the platform.

In order to maintain steady flow of the water below the platform, the container is shaped so that the cross-section of the passage below the platform is substantially constant at all points along the length of the container, this being ensured by inward tapering of the walls of the container and downward sloping of the base of the container along its length from each end.

When the apparatus is in use, a skier 17 using it stands on water skis 18 on the platform 12. He holds himself in position by gripping a horizontal bar 19. The circulation of the water having been started, by taking his weight on his arms he can rise to the surface of the water and maintain himself in that position as the water flows past him giving him the sensation obtained when a skier moves over the surface of the water.

To heighten the illusion a bar 20 can be disposed further away from the container 11 than the bar 19 and the skier 17 can pull on a pair of flexible cords 21 attached thereto simulating the two ropes used in real water skiing.

When used for instructional purposes, the container 12 can be fitted with a seat 22 for the skier 17 while he is being instructed as to the use of his feet and on which he can seat himself in the event of loss of balance. The seat 22 is best arranged at a height such that by rising only slightly from it one assumes the normal posture of a skier.

As a safety precaution a grill 23 may be arranged for closing the gap between the platform 12 and the container at the rear end without obstructing the flow of water. As a further safety precaution a net (not shown) may be arranged so as normally to hang a little behind the skier 17 for supporting him in the event of his overbalancing.

The container 11 and the platform 12 can be made of a variety of materials such as sheet metal or sheet plastics. The platform must of course be rigid but the container could consist of a framework covered with waterproof fabric.

In order to avoid eddying and turbulence at the ends of the platform where the direction of movement of the water is reversed, the platform can be thickened at those ends and be provided with a streamlined under surface. This, of course, involves, reshaping of the container so that its effective cross-sectional area remains substantially constant at all points along the length of the container.

The apparatus 25 shown in Figures 2 to 4 is basically similar to the apparatus 10 shown in Figure 1. The apparatus 25 comprises a container 27 within which is positioned a platform 28 so as to define a lower water passage 30, smoothly curved outlet and inlet end pas-

sages 31 and 32 and an open upper passage 33. Its end passages 31 and 32 and the lower passage 30 preferably have a larger cross-section than the upper passage 33 and then the water will travel more slowly and smoothly through these passages.

The outlet end passage 31 is divided into two and in these two passages are mounted two propellers 35 for circulating the water around the container. These propellers are driven by one or a pair of motors (not shown).

As a safety precaution the inlet end passage 32 may be covered with a grill 36 which does not impede the flow of water.

Once the water is being circulated around the container 27 a skier can 'ski' on the water in the upper passage 33 in a similar manner to that described in connection with the apparatus shown in Figure 1.

Although two propellers 35 are shown any convenient number could be used.

The inlet end passage 32 increases substantially uniformly in area so as gradually to slow down the velocity of the water and so as to reduce energy losses. For this purpose a slight hump 34 is provided on the platform 12 and this directs the flow of water upwardly and gives the largest possible radius of turn again reducing energy losses.

A convenient size for the containers 11 and 27 is about 10 feet by 5 feet. That, however, does not give the user the opportunity of simulating slalom and so they may be larger. There is, of course, no reason why the width should not be considerably greater than 5 feet. Also with a wide container, provision can be made for removable vertical partitions which can be put in position to convert a wide container into a battery of narrow containers side by side.

The apparatus can be used in conjunction with various means for making the skiing exercise more realistic. For example, moving panels, screens, movie films and so on can be arranged within the range of vision of the user. These can, if desired, form the walls of a room in which the apparatus is housed. One can also provide means for simulating rough water such as is encountered by a skier behind a towing boat.

Other means can be used for moving the water than the screw 16 or propellers 35 shown in the drawings. A pump could be used which would preferably be of the centrifugal type. It could also be advantageous to arrange an impeller (of any desired kind) towards each end of the container. It may be also advantageous for the speed of the water to be variable so that the more proficient skiers can get practice at faster speeds and so that a skier can get practice at varying speeds.

#### WHAT I CLAIM IS:—

1. An apparatus for simulating water-skiing comprising an open topped container having an opening of at least such a size as to accom-

- modate a skier standing on water skis, means for circulating through the container in the direction of its length a shallow stream of water and support means enabling a skier to hold himself against being entrained by the stream of water while he endeavours to remain supported on his skis on the surface of the stream.
- 10 2. An apparatus as claimed in claim 1 comprising a platform which extends to the sides of the container but stops short of its ends at a height to allow the water to be circulated over the platform and, back underneath the platform.
- 15 3. An apparatus as claimed in claim 2, in which the water is returned around and underneath the platform through a passage which has a substantially constant cross-sectional area.
- 20 4. An apparatus as claimed in claim 3, in which the passage through which the water is returned around and underneath the platform is of larger cross-sectional area than the cross-sectional area of the shallow stream of water.
- 25 5. An apparatus as claimed in claim 4, in which the inlet for the shallow stream of water to the passage through which the water is returned is of more restricted cross-sectional area than the cross-sectional area of the shallow stream of water.
- 30 6. An apparatus as claimed in any preceding claim, in which one or more propellers or screws are provided for circulating the water within the container.
- 35 7. An apparatus as claimed in any of claims 2 to 5 in which one or more propellers or screws are mounted underneath the platform for circulating the water within the container.
- 40 8. An apparatus as claimed in any of claims 2 to 5 in which one or more propellers or screws are mounted adjacent to one end of the platform for circulating the water within the container.
- 45 9. An apparatus as claimed in any preceding claims, in which the support means comprise a bar mounted horizontally near one end of the container so that the skier in his normal skiing position faces the bar and can hold on to it.
- 50 10. An apparatus as claimed in any of claims 1 to 8, in which the support means includes a handlebar to be gripped by the skier which is attached to fixed means by one or more flexible cords, so as to simulate water-skiing tow ropes.
- 55 11. An apparatus as claimed in any of the preceding claims, in which a seat is provided near the rear end of the container so that a skier can sit with his skis on the surface of the stream of water.
- 60 12. An apparatus as claimed in any preceding claim, in which the container is rectangular in plan view and is relatively long and shallow.
- 65 13. An apparatus for simulating water skiing substantially as herein described with reference to Figure 1 or Figures 2 to 4 of the accompanying drawings.

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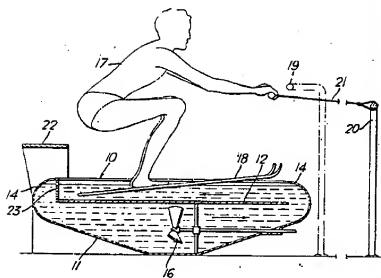
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from which copies may be obtained.

*Fig. 1.*



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## COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheets 1 & 2.

Fig. 3

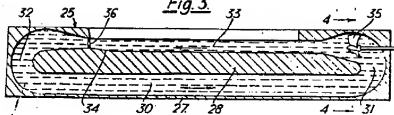


Fig. 2

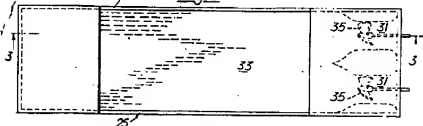


Fig. 4

